ELECTRICAL SAFETY

FIGURE 3 (SLIDE EP08AL-S03)

Do you recall the times a news article has begun with the following words? "A man was electrocuted today." This statement has been in the news ever since man had easy access to electricity. All it takes is a split second of inattention or a minor error and anyone can die from the power of electricity. Someone will always die from electrical shock until people learn to respect electricity and use the utmost caution when working around it.

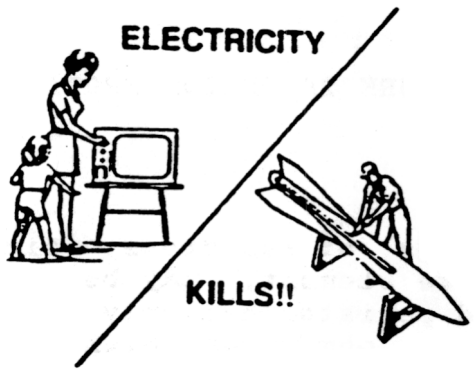

FIGURE 4 (Slide EP08AL-S04)

Modern man encounters electricity everyday. The house wife uses it in her work around the home and you, as a technician, will work with electricity everyday. As a technician, one of the most important things you will learn is how to work with electricity safely. As long as you remember and practice the safety procedures that will be presented in this lesson, you have a better chance of a long life.

ELECTRICITY KILLED

FIGURE 5 (SLIDE EP08AL-05)

If you decide to ignore safety procedures when working with electricity, it is very possible that you will depart from this earth earlier than expected.

TWO FACTORS WHICH DETERMINE IF A SHOCK IS FATAL

1. **THE AMOUNT OF CURRENT ENTERING THE BODY.**
2. **THE PATH CURRENT TAKES THROUGH THE BODY.**

FIGURE 6 SLIDE EP08AL-S06)

Before we discuss the safety procedures used when working with electronic equipment, let's see how electricity kills. There are two (2) factors that will determine if an electrical shock is fatal.

The amount of current entering the body

The path current takes through the body

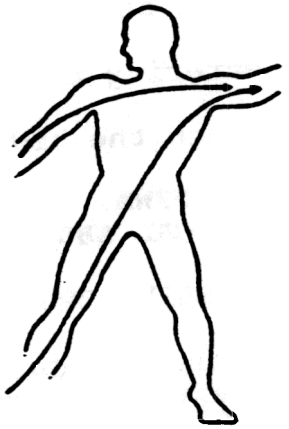

FIGURE 7 (SLIDE EP08AL-S07)

If the current flows through the heart, lungs, brain, or spine, death may be instantaneous. Even through the path of current may not be through the vital organs, severe injury may still occur.

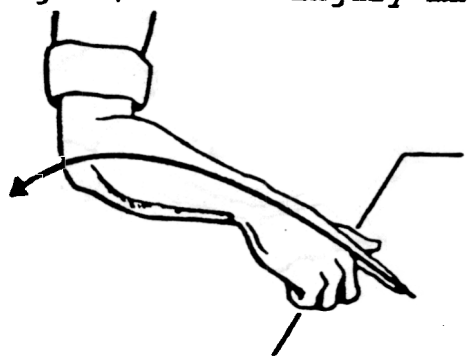

FIGURE 8 (SLIDE EP08AL S08)

If the current enters the hand and exits the elbow, the tissue between the hand and elbow could be severely burned and the nerves could be destroyed. The muscles could suddenly contract and you could be thrown against an object, causing severe injury.

WHAT TWO FACTORS WILL DETERMINE IF AN ELECTRICAL SHOCK IS FATAL?

1. _____

2. _____

FIGURE 9 (SLIDE EP08AL-S09)

What two (2) factors will determine if an electrical shock is fatal?

1. THE AMOUNT OF CURRENT ENTERING THE BODY.
2. THE PATH CURRENT TAKES THROUGH THE BODY.

FIGURE 10(SLIDE EP08AL-S10)

The two factors will determine if an electrical shock is fatal.

1. The amount of current entering the body.
2. The path of current through the body

IS THERE ANYWAY TO AVOID ELECTRICAL SHOCK?"

FIGURE 11 (SLIDE EP08AL-S11)

At this point you may be saying to yourself, "How long will I stay alive in this career? Is there anyway to avoid electrical shock?" The following general safety procedure will prevent electrical shock and help you stay alive when working with electrical equipment.

ELECTRICAL SAFETY

1. NO JEWELRY	**5. CLEAN WORK AREA**
2. GROUND EQUIPMENT	**6. ONE HAND RULE**
3. RUBBER MATS	**7. DON'T TOUCH CONTACT**
4. NO HORSEPLAY	**8. POWER OFF FOR REPAIRS**

FIGURE 12 (SLIDE EP08AL-S12)

1. Do not wear jewelry when working on equipment.
2. All equipment must be connect to a common ground.
3. Use rubber mats when available
4. Never engage in or allow horseplay.
5. Always keep your work area neat and clean.
6. When working with electronic equipment will power applied, keep one hand behind your back.
7. Never touch anything inside the equipment with power applied.
8. Always turn the equipment off before making repairs.

DO NOT WEAR JEWELRY WHEN WORKING ON EQUIPMENT

FIGURE 13 (SLIDE EP08AL-S13)

Do not wear jewelry when working on equipment.

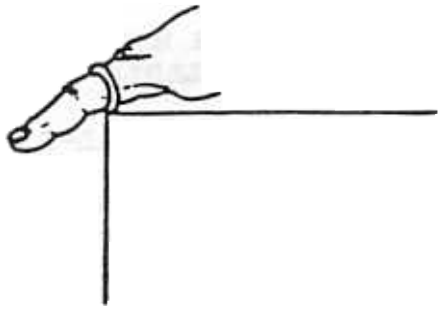

FIGURE 14 (SLIDE EP08AL-S14)

Metal is an excellent conductor of electricity. Any piece of jewelry is dangerous. We will discuss the ring to show how wearing jewelry when working on equipment is dangerous. When a ring becomes a conductor of electricity, the rings gets hot and may begin to melt. This could results in a severely burned finger, a missing finger, or death. Other than electrical danger, jewelry also poses a mechanical danger.

Jewelry can snag on a piece of equipment which could cause physical injury. The wise individual will never wear jewelry when working on electronic equipment.

ALL EQUIPMENT MUST BE CONNECTED TO A COMMON GROUND

FIGURE 15 (SLIDE EP08AL-S15)

All equipment must be connected to a common ground. Some of the equipment you will be working on will have a voltage between the outer case and another point of the equipment. Voltage is the force that causes current to flow. This could be a dangerous situation.

COMMON GROUND

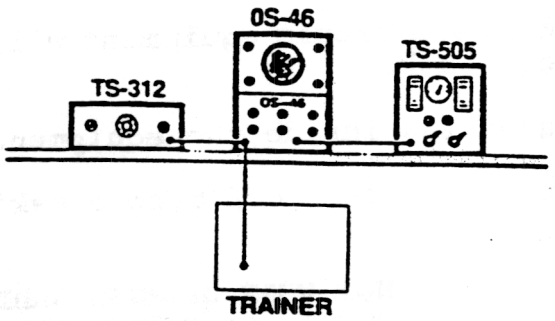

FIGURE 16 (SLIDE EP08AL-S16)

If the equipment has a ground wire attached to the outer case and is connected to a common ground, no voltage can exist on the outer case. Remember, all equipment must be connected to a common ground

USE RUBBER MATS WHEN AVAILABLE

FIGURE 17 (EP08AL-S17)

Use rubber mats when available. The rubber mats insulated your body from ground. In other words, they prevent a path for current through your body.

RUBBER MATS

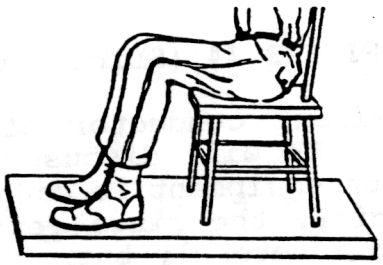

FIGURE 18 (SLIDE EP08AL-S18)

ELECTRICAL SAFETY

Keep both feet on the mat at all times when working on the equipment. If you are using a chair, make sure all four (4) legs of the chair remain on the mat.

**NEVER ENGAGE IN
OR ALLOW HORSEPLAY**

FIGURE 19 (SLIDE EP08AL-S19)

Never engage in or allow horseplay. Horseplay around equipment is dangerous because mechanical or electrical injury may occur. If you see horseplay or practical jokes occurring around equipment, you should stop immediately.

**ALWAYS KEEP YOUR
WORK AREA NEAT
AND CLEAN**

FIGURE 20 (SLIDE EP08AL-S20)

Always keep your work area neat and clean. An organized work area reduces the possibility of an accident. All equipment and tools being used should be organized in an orderly manner. Keeping your work area organized reduces the chance of something slipping and causing an accident.

**WHEN WORKING WITH ELECTRONIC
EQUIPMENT WITH POWER APPLIED,
KEEP ONE HAND BEHIND YOUR BACK**

FIGURE 21 (SLIDE EP08AL-S21)

When working with electronic equipment with power applied, keep one hand behind your back. This is often referred to as the one hand rule.It is hard to keep one hand behind your back at all times. If you are repairing a piece of equipment, power should not be applied to the equipment and both hands can be used. While taking measurements, only one hand is needed to hold the test probe. The free hand should be kept behind the back.

**NEVER TOUCH ANYTHING INSIDE
THE EQUIPMENT WITH POWER
APPLIED**

FIGURE 22 (SLIDE EP08AL-S22)

Never touch anything inside the equipment with power applied. Electrical circuits inside the equipment may look harmless, but electricity cannot be seen. An electrical circuit may have several thousands volts applied to it. If you touch this circuit, it could be your last mistake.

ELECTRICAL SAFETY

Keep both feet on the mat at all times when working on the equipment. If you are using a chair, make sure all four (4) legs of the chair remain on the mat.

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ELECTRICAL SAFETY

Your first move should be to separate the person who is being electrocuted from the power source. The quickest way to separate anyone from a power source is to turn off the power.

All electrical equipment has an on/off switch, or circuit breaker, where the power can be turned off. You should learn the location of on/off switches and circuit breakers on any piece of equipment you are working on. What would you do if you couldn't get to the power switches?

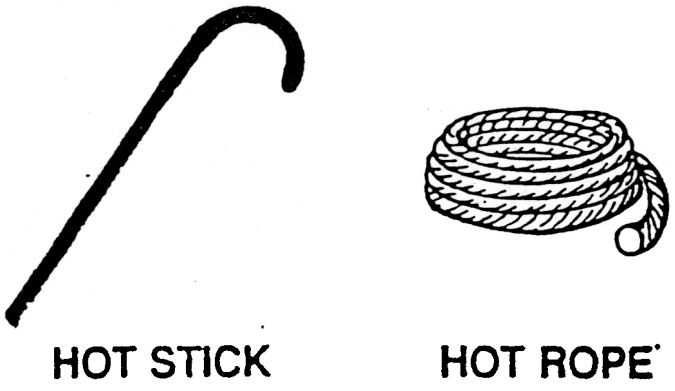

FIGURE 27 (SLIDE EP08AL-S27)

You should resort to the hot rope or hot stick. The hot rope or hot stick is used to help pull the victim away from the power source. If you grab the victim with your bare hands, you would become a conductor of current. This could result in your electrocution. After the victim is separated from the power source, proceed with First Aid for Shock, if needed.